

WHAT IS CLAIMED IS:

1. A communication system capable of avoiding congestion in transmission of moving image data, comprising:

at least one receiving terminal;

a moving image delivery device for delivering moving image data to said at least one receiving terminal;

a moving image conversion device including at least one moving image conversion means for converting, in accordance with conversion parameters, the moving image data sent from said moving image delivery device, a conversion parameter setting means for determining the conversion parameters, and a monitored result receiving means; and

at least one packet switching node including at least one data storage means for preliminarily storing the moving image data from said moving image conversion device to be sent to said at least one receiving terminal, a data amount monitor means for monitoring an amount of the moving image data stored in said at least one data storage means to judge that the monitored data amount reaches a first threshold, and a monitored result sending means for sending a congestion preview information to said moving image conversion device when said data amount monitor means judges that the monitored data amount reaches the first threshold,

said monitored result receiving means receiving the congestion preview information from said monitored result

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sending means, said conversion parameter setting means determining the conversion parameters so that said moving image conversion means converts the moving image data sent from said moving image delivery device into a moving image data with a smaller coding bit rate smaller.

2. The communication system as claimed in claim 1, wherein said data amount monitor means monitors an amount of the moving image data stored in said at least one data storage means to judge that the monitored data amount reaches a second threshold which is smaller than said first threshold, wherein said monitored result sending means sends a congestion avoidance information to said moving image conversion device when said data amount monitor means judges that the monitored data amount reaches the second threshold, wherein said monitored result receiving means receives the congestion avoidance information from said monitored result sending means, and wherein said conversion parameter setting means determines the conversion parameters so that said moving image conversion means converts the moving image data sent from said moving image delivery device into a moving image data with a larger coding bit rate.

3. The communication system as claimed in claim 2, wherein said data amount monitor means judges that it is the

congestion preview state until the monitored data amount reaches the second threshold after the monitored data amount reaches the first threshold, and that it is the congestion avoidance state until the monitored data amount reaches the first threshold after the monitored data amount reaches the second threshold.

4. The communication system as claimed in claim 2, wherein said monitored result sending means sends the congestion preview information or the congestion avoidance information at a constant interval.

5. The communication system as claimed in claim 1, wherein said data amount monitor means calculates a new coding bit rate when said data amount monitor means judges that the monitored data amount reaches the first threshold, wherein said monitored result sending means sends the calculated new coding bit rate in addition to the congestion preview information, wherein said monitored result receiving means receives the calculated new coding bit rate in addition to the congestion preview information, and wherein said conversion parameter setting means determines the conversion parameters so that said moving image conversion means converts the moving image data sent from said moving image delivery device depending upon the calculated new coding bit rate.

6. The communication system as claimed in claim 5, wherein said data amount monitor means calculates a new coding bit rate enabling to avoid congestion state after a lapse of a predetermined time, depending upon a change in the stored data amount during a predetermined period of time.

7. The communication system as claimed in claim 6, wherein said data amount monitor means calculates a low coding bit rate so as to decrease a difference between an estimate data amount after a lapse of the predetermined time and a second threshold which is smaller than said first threshold, when the change in the stored data amount during a predetermined period of time is positive change.

8. The communication system as claimed in claim 6, wherein said data amount monitor means calculates a high coding bit rate so as to increase a difference between an estimate data amount after a lapse of the predetermined time and an amount of data now stored, when the change in the stored data amount during a predetermined period of time is negative change.

9. The communication system as claimed in claim 1, wherein said data amount monitor means monitors, instead of the amount of data stored in said at least one data storage means, a data

amount which is smoothed in accordance with the amount of data stored in said at least one data storage means.

10. The communication system as claimed in claim 1, wherein said at least one receiving terminal includes a plurality of receiving terminals, and said conversion parameter setting means includes a plurality of conversion parameter setting means for the respective receiving terminals, wherein said at least one data storage means includes a plurality of data storage means for preliminarily storing the moving image data to be sent to the respective receiving terminals, said data amount monitor means monitors the stored data for the respective receiving terminals, and said monitored result sending means sends the congestion preview information or the congestion avoidance information for the respective receiving terminals, and wherein said monitored result receiving means receives the congestion preview information or the congestion avoidance information for the respective receiving terminals, and said conversion parameter setting means determines the conversion parameters for the respective receiving terminals.

11. A communication method capable of avoiding congestion in transmission of moving image data, comprising the steps of:

converting moving image data to be delivered to at least one receiving terminal, in accordance with conversion

parameters;

preliminarily storing the converted moving image data to be sent to said at least one receiving terminal;

monitoring an amount of the stored moving image data to judge that the monitored data amount reaches a first threshold;

sending a congestion preview information when it is judge that the monitored data amount reaches the first threshold;

receiving the sent congestion preview information; and
determining the conversion parameters so that said converting step converts the moving image data into a moving image data with a smaller coding bit rate.

12. The communication method as claimed in claim 11, wherein said monitoring step includes monitoring an amount of the stored moving image data to judge that the monitored data amount reaches a second threshold which is smaller than said first threshold, wherein said sending step include sending a congestion avoidance information when it is judged that the monitored data amount reaches the second threshold, wherein said receiving step includes receiving the congestion avoidance information, and wherein said determining step includes determining the conversion parameters so that said converting step converts the sent moving image data into a

moving image data with a larger coding bit rate.

13. The communication method as claimed in claim 12, wherein said monitoring step includes judging that it is the congestion preview state until the monitored data amount reaches the second threshold after the monitored data amount reaches the first threshold, and judging that it is the congestion avoidance state until the monitored data amount reaches the first threshold after the monitored data amount reaches the second threshold.

14. The communication method as claimed in claim 12, wherein said sending step includes sending the congestion preview information or the congestion avoidance information at a constant interval.

15. The communication method as claimed in claim 11, wherein said monitoring step includes calculating a new coding bit rate when it is judged that the monitored data amount reaches the first threshold, wherein said sending step includes sending the calculated new coding bit rate in addition to the congestion preview information, wherein said receiving step include receiving the calculated new coding bit rate in addition to the congestion preview information, and wherein said determining step includes determining the

conversion parameters so that said converting step converts the moving image data depending upon the calculated new coding bit rate.

16. The communication method as claimed in claim 15, wherein said monitoring step includes calculating a new coding bit rate enabling to avoid congestion state after a lapse of a predetermined time, depending upon a change in the stored data amount during a predetermined period of time.

17. The communication method as claimed in claim 16, wherein said monitoring step includes calculating a low coding bit rate so as to decrease a difference between an estimate data amount after a lapse of the predetermined time and a second threshold which is smaller than said first threshold, when the change in the stored data amount during a predetermined period of time is positive change.

18. The communication method as claimed in claim 16, wherein said monitoring step includes calculating a high coding bit rate so as to increase a difference between an estimate data amount after a lapse of the predetermined time and an amount of data now stored, when the change in the stored data amount during a predetermined period of time is negative change.

19. The communication method as claimed in claim 16,
wherein said monitoring step includes monitoring, instead of
the stored data amount, a data amount which is smoothed in
accordance with the stored data amount.

20. The communication method as claimed in claim 11,
wherein said converting step includes converting the moving
image data to be sent to a plurality of receiving terminals,
said storing step includes preliminarily storing the converted
moving image data for the respective receiving terminals, said
monitoring step includes monitoring the stored data for the
respective receiving terminals, and said sending step include
sending the congestion preview information or the congestion
avoidance information for the respective receiving terminals,
and wherein said receiving step includes receiving the
congestion preview information or the congestion avoidance
information for the respective receiving terminals, and said
determining step includes determining a plurality of
conversion parameters for the respective receiving terminals.